

## REMARKS

### Introduction

By this amendment, claims 7-11 are cancelled, claims 12-22 are amended, and claims 23-41 are newly added. No new subject matter is introduced by the amendments. Presently, claims 12-25 are pending and under examination.

Applicants thank the Examiner for noting the allowability of claim 18. The subject matter of claim 18 has been incorporated into new claim 24. Thus, claim 24 and its dependent claims 26-33 are believed to be allowable.

The Office Action rejected claims 8-17 and 19-22 over cited art. Applicants respectfully traverse the rejections and in light of the preceding amendments and the following arguments, request that the rejections be withdrawn.

### Rejection of claims 8, 13, 14, 17 and 19 under 35 U.S.C. § 102(b) by U.S. Patent 5,879,811 to Tanaka et al. (hereinafter Tanaka)

Claims 8, 13, 14, 17 and 19 were rejected under 35 U.S.C. § 102(b) as anticipated by Tanaka. Applicants respectfully traverse the rejection. Nonetheless, claim 8 is cancelled, and claims 13, 14, 17 and 19 are amended to include the limitations of previously pending claims 9 and 10. It is believed that the rejection is now moot. Withdrawal of the rejection is respectfully requested.

### Rejection of claims 12, 15, 16 and 20 under 35 U.S.C. §103(a) over Tanaka

Claims 12, 15, 16 and 20 were rejected as unpatentable over Tanaka. Applicant's respectfully traverse the rejection. Nonetheless, the claims have been amended to include the limitations of previously presented claims 9 and 10, and it is believed that this rejection is also rendered moot. Withdrawal of the rejection is respectfully requested.

Rejection of claims 9-10 under 35 U.S.C. § 102(a) over Tanaka in view of U.S. Patent Application No. 2005/01589041 A1 to Yamazaki (hereinafter Yamazaki)

Previously pending claims 9 and 10 were rejected an obvious over Tanaka as applied to claim 8 and further in view of Yamazaki. This rejection will be discussed with respect to new claim 23, which contains the limitations of claims 8, 9, and 10. Tanaka is directed to an oxide film having a quartz crystal structure formed on a substrate by a sol gel process. As admitted by the Office Action, Tanaka does not disclose the use of hydrogen chloride as a catalyst as required by Applicants' claim 23.

Yamazaki is directed to the formation of an improved thin film semiconductor device that includes forming a silicon oxide film. HCl is used to add chloride to the silicon oxide film that forms a gate isolation film of TFT. Contrary to the position asserted in the Office Action, Yamazaki does not disclose the use of hydrogen chloride as a catalyst for the reaction of silicon with oxygen; rather, Yamazaki discloses that a halogen may be used in the process to prevent natrium contamination (Yamazaki, para 31). The combination of Tanaka and Yamazaki fails disclose the required claim limitation. Therefore, it is respectfully submitted that claim 23 is patentable over the cited references. Claims 12-20, which depend from claim 23, are also patentable. Withdrawal of the rejection is respectfully requested.

Rejection of claims 11 and 21 under 35 U.S.C. § 103(a) over Tanaka in view of JP 08-110425 to Okano (hereinafter Okano) or JP 05-215929 to Tokunga (hereinafter Tokunga)

Applicant's previously pending claims 11 and 21 were rejected as obvious over Tanaka in view of Okano or Tokunga. As claims 11 and 21 have been cancelled and incorporated into new claim 25, this rejection will be discussed with respect to claim 25. Applicant's new claim 25 requires the step of forming a crystal buffer layer of quartz. As admitted in the Office Action, Tanaka does not disclose the use of a buffer layer. Likewise, Okano does not disclose the use of a crystal buffer

layer of quartz. Instead, Okano discloses the formation of a *glass* buffer layer to lessen the warpage of a silicon substrate after formation of a buffer layer and a core glass film. This disclosure by Okano does not teach or suggest the use of the crystal buffer layer of the present invention, which is formed to correct nonconformity in lattices, prevent cracking caused by differential thermal expansion, and provide growth in a width direction in the initial growing stage. (See Application Specification, page 6, lines 2-4. See also page 5, bottom paragraph discussing stating that the buffer layer is crystal.)

There is no motivation to combine Tanaka and Okano. Tanaka is directed to the creation of a thin film of quartz crystal structure, where Okano is directed to the formation of a core glass film and a clad layer. The Office Action asserts that "[i]t would have been obvious to a person of skill in the art to modify . . . Tanaka et al with Okano et al's quartz buffer to form a glass waveguide because warpage is reduced." Applicants respectfully disagree. A person of skill in the art would not be motivated to combine the references, because the references are directed to the formation of different types of layers. Further, there is no reason to believe that a method of reduction of warpage on a *glass* film would be effective for a *crystal* film. There is also no indication that warpage is a problem during the formation of crystal quartz in Tanaka. More importantly, there is no suggestion in the references themselves of the desirability of such a combination. Rather, it appears that the Examiner is using Applicants' specification as the motivation to combine the two references. However, when establishing a prima facie case for obviousness, motivation to combine the references must come from the prior art, not Applicant's disclosure. (See MPEP, §2142)

Even if the references were combined, neither Tanaka or Okano disclose the use of a crystal buffer layer; thus, the combination of the references fails to disclose all of the limitations of Applicant's claim 25. Therefore, claim 25, and dependent claims 34-41 are not rendered obvious by the combination.

The Office Action then asserts that "it would have been obvious to a person of skill in the art to modify Tanaka et al with Tokunaga et al's buffer layer of quartz to form a glass waveguide with a

small transition loss." Applicants' disagree. Like Tanaka and Okano, Tokunuga also fails to disclose the step of forming a crystal buffer layer. Tonkunuga is directed to production of a glass waveguide that includes the formation of a buffer layer of quartz *glass* in which fluorine is doped. The disclosure of Tokunuga does not teach or suggest the use of the crystal quartz buffer layer as presently claimed.

Even if Tanaka and Tokunuga were combined, the combination would not result in a crystal buffer layer as required by Applicants' claim 25. Because the combination of the references fails to disclose all the limitation of claim 25, the claim is patentable over Tanaka and Tokunuga. Further, claims 34-41, which depend from claim 25, are also patentable over the references. Withdrawal of the rejection is respectfully requested.

Rejection of claim 22 under 35 U.S.C. § 103(a) over Tanaka in view of Okano or Tokunuga and further in view of U.S. Patent 5,904,770 to Ohtani

As claim 22 has been amended to depend from claim 25, it is submitted that the rejection is moot. In light of the above arguments, it is further submitted that claim 22 is allowable as depending from claim 25. Withdrawal of the rejection is respectfully requested.

Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. Accordingly, Applicants request that the Examiner issue a Notice of Allowance indicating the allowability of claims 12-41 and that the

application be passed to issue. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application.

Respectfully submitted,

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